

RELEASE RELAY

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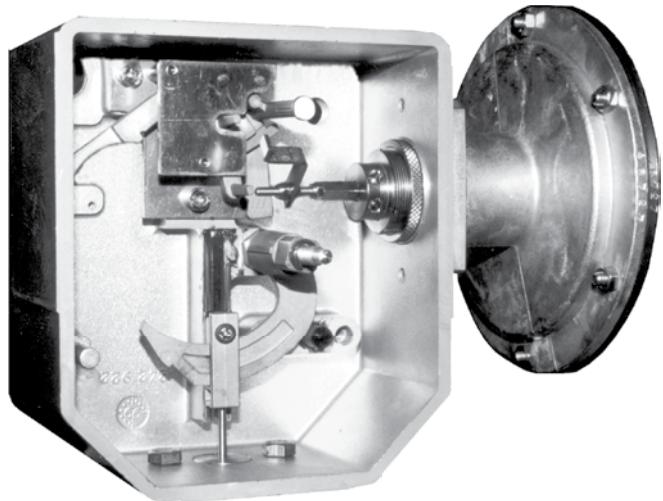


Figure 1. Type OS2

MECHANISM BOX (BM)

The mechanism box is designed to close a slam shut valve. The operation is ensured in two successive stages: a detection stage and a power stage. The separation between the detection stage and the power stage provides maximum precision, indifferent of working pressure, slam shut valve diameter and gas flow. After activation of the slam shut valve due to over or under pressure, the mechanism box must be reset manually. The complete system is available, on request only, sealed with lead and wire.

SAFETY MANOMETRIC BOX (BMS)

The pressure data is transformed into a displacement by a safety manometric box (Type BMS 1) mounted on the mechanism box (BM). This displacement is used to activate the detection stage of the mechanism box in the case of overpressure, over or underpressure, or underpressure condition.

In certain configurations, a second box may be used (Type BMS 2).

INTRODUCTION

The Type OS2 Release Relay consists of a Mechanism Box (BM) and one or two Safety Manometric Boxes (BMS). Its function is to provoke the activation of a slam shut valve which may be stand alone (Type OSE), integrated in a regulator (Types MP, MPS, DRPNPIL, EZH, DRPN and EZR) or integrated in a Type K1000/K3000, in the case of under or over pressure in the controlled gas network. It may be mounted on systems of DN 25 to DN 150 and up to PN 100.

It is tight shut and submersible. It may be connected to an explosion-proof contact (intrinsically safe).

Type OS2

LABELLING

| | | | | |
|--------------------------|-------------|---------|-------------|-----|
| BMS Taille Size | See Table 1 | PSD BMS | See Table 1 | bar |
| Nº Série Serial | | AG maxi | See Table 1 | |
| FRANCEL Ressort/Spring Ø | | | | mm |
| | | | $\Delta 1$ | bar |

Figure 2. Max. Pressure Triggering

| | | | | |
|--------------------------|-------------|---------|-------------|-----|
| BMS Taille Size | See Table 1 | PSD BMS | See Table 1 | bar |
| Nº Série Serial | | AG maxi | See Table 1 | |
| FRANCEL Ressort/Spring Ø | | | | mm |
| Wdsu | | | $\Delta 1$ | bar |

Figure 3. Min. Pressure Triggering

| | | | | |
|--------------------------|-------------|------------|-------------|-----|
| BMS Taille Size | See Table 1 | PSD BMS | See Table 1 | bar |
| Nº Série Serial | | AG maxi | See Table 1 | |
| FRANCEL Ressort/Spring Ø | | | | mm |
| Wdsu Wdso | | $\Delta 1$ | $\Delta 2$ | bar |

Figure 4. Max. and Min. Pressure Triggering

See Tables 14, 15 and 16 for other values.

TYPES OF INSTALLATION

Mounting on horizontal pipeline only:

Top Mounted (stand-alone valve)

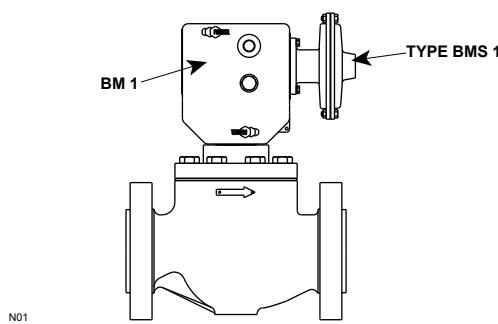


Figure 5. BM 1: Mechanism Box with One Safety Manometric Box (Type BMS 1)

Bottom Mounted (integrated valve and regulator)

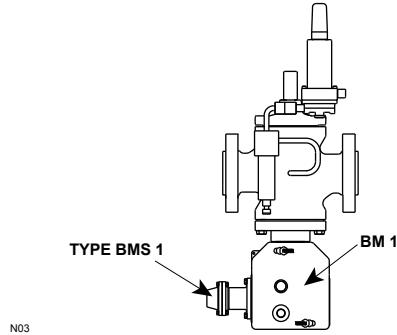


Figure 6. BM 1: Mechanism Box with One Safety Manometric Box (Type BMS 1)

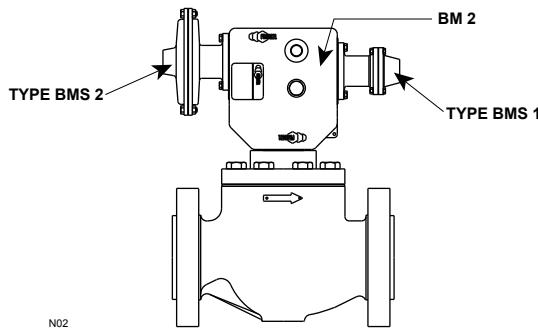


Figure 7. BM 2: Mechanism Box with Two Safety Manometric Boxes (Types BMS 1 and BMS 2)

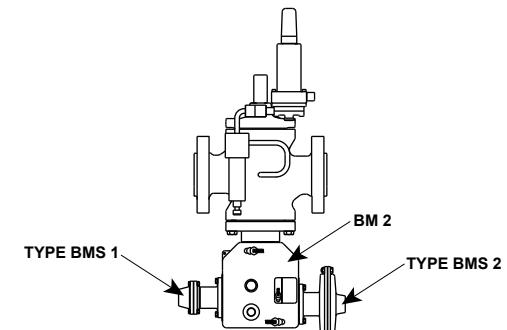


Figure 8. BM 2: Mechanism Box with Two Safety Manometric Boxes (Types BMS 1 and BMS 2)

CHARACTERISTICS

| | | |
|---|-----------------|----------------------|
| Accuracy | AG 2.5 | Diaphragm or bellows |
| | AG 5 | Piston |
| Memorization | No memorization | ---- |
| Resistance to vertical shocks | 4 J | (20 shocks) |
| Resistance to pendular shocks | 9.81 J | (20 shocks) |
| Sealing | IP 67 | Temporary immersion |
| Maximum operating pressure (PSD) | 100 bar | ---- |
| Operating temperature | -30°C to +71°C | ---- |
| Maximum valve travel | 50 mm | ---- |

DIMENSIONS AND WEIGHTS

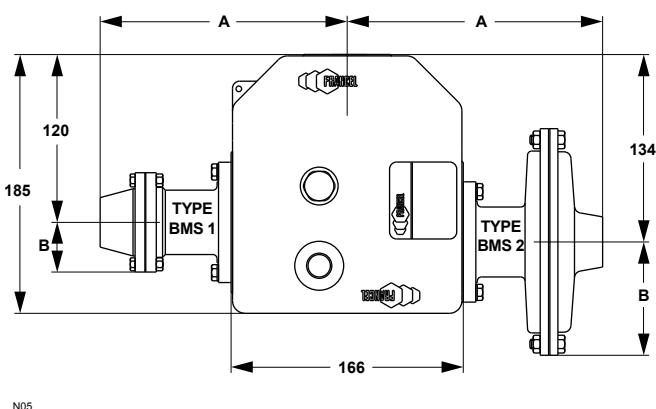


Figure 9. Dimensions

DESCRIPTION AND SPARE PARTS (BM)

Table 3. Mechanism Box Assembly

| Item | Description | BM1 | BM2 |
|------|--|-------------|---------|
| | Mechanism box | 181 067 | 181 068 |
| 1 | Cap including indicator, O-ring and screw (new version 06/2007; interchangeable) | 181 328 | |
| | New cap O-ring | 145 430 | |
| 2 | Mechanism box casing | 142 930* | 144 071 |
| | Box gasket | 142 930* | |
| 3 | BMS gasket | 145 431A* | |
| | BMS screw | 402 018* | |
| | BMS sealing screw O-rings | 461 150* | |
| 4 | Non-connectable brace vent | 27A5516X012 | |
| | Vent link for 8 x 10 tube | 406 526 | |
| 5 | Yoke | 181 042 | |
| | Fixed bolt axe (do not dismount) | 142 920 | |
| 6 | Bolt | 181 043 | |
| | Truarc O-ring | 406 128 | |
| 7 | Travel stop | 140 324 | |
| | Damper | 127 692 | |
| 8 | Mechanism | 181 041 | |
| | Mechanism screw | 402 512 | |
| 9 | Resetting tool | 242 915 | |

* Sold as a set ref. n° 197 351.
Items in bold are spare parts.

Table 2. Dimensions and Weights

| | Type | Dimensions, mm | | Weight, kg |
|------------|----------|----------------|------|------------|
| | | A | B | |
| BM | BM1 | For 1 BMS | ---- | 2.5 |
| | BM2 | For 2 BMS | ---- | 2.5 |
| BMS | 162 | Diaphragm | 181 | 83 |
| | 71 | Diaphragm | 175 | 36 |
| | 27 or 17 | Piston | 204 | 36 |
| | 236 | Bellows | 202 | 36 |
| | 315 | Bellows | 223 | 36 |

For a Type OS2 with one BMS add the weight of the BMS to that of the BM 1.

For a Type OS2 with two BMS add the weight of the two BMS to that of the BM 2.

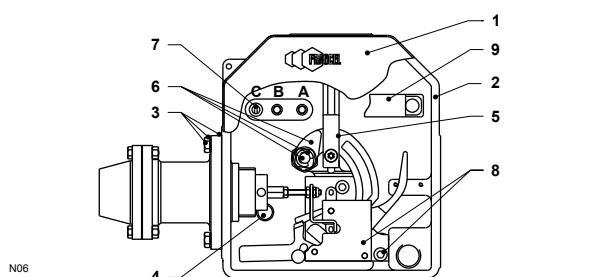


Figure 10. Mechanism Box for One BMS

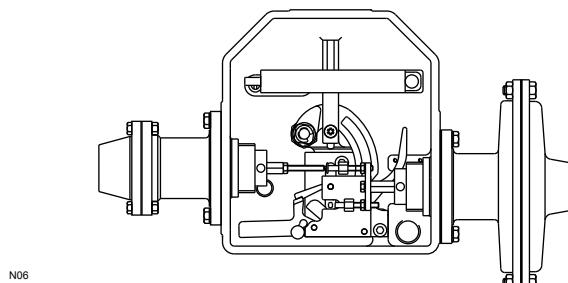


Figure 11. Mechanism Box for Two BMSs

CONNECTIONS

Table 4. Connection Types

| | | |
|------------------------|--------------------------|----------|
| Non connectable | Plastic vent with screen | 1/4" NPT |
| Connectable | Link 8/10 tube | |
| Contact | Box exit | 1/2" NPT |

Type OS2

DESCRIPTION AND SPARE PARTS (BM)

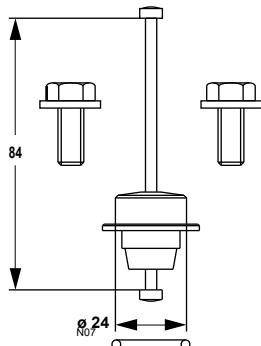


Figure 12. Standard
Packing Gland

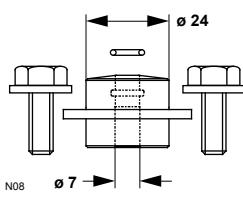


Figure 13. Type VSE
Packing Gland

Table 5. Packing Gland Assembly

| Description | Packing gland | | |
|------------------------|----------------|----------------|----------------|
| | Valve | | |
| | Type OSB | Type VSE | Standard |
| Assembly | 181 089 | 181 090 | 181 104 |
| Packing gland and stem | 181 040 | ---- | 181 040 |
| Packing gland | ---- | 144 126 | ---- |
| O-ring | 400 514 | 400 505 | 400 514 |
| O-ring | ---- | 400 221 | ---- |
| Fastening screw H M7 | 402 028 | ---- | 402 028 |
| Fastening screw H M8 | ---- | 402 036 | 402 036 |
| Flat washer (7) | 405 005 | ---- | 405 005 |
| Flat washer (8) | ---- | 405 006 | 405 006 |

Items in bold are spare parts.

OPERATION (BM)

The detection stage consists of two parts:

- The releasing stem (key 1) and
- The 1st stage trigger (key 2).

Through the intermediate of the safety manometric box (BMS), the pressure provokes a pin movement (D1 or D2), which provokes the rotation of the releasing stem (key 1) and frees the 1st stage trigger (key 2).

The power stage consists of two parts:

- The 2nd stage trigger (key 3) and
- The cam (key 4).

The 2nd stage trigger (key 3), activated by the 1st stage trigger (key 2), frees the cam (key 4), which provokes the valve to close. After release, the resetting is ensured in two stages: (detection stage, then power stage) see «commissioning».

Position indicator

The position of the detection stage can be seen through the position indicator glass.

Memorization

The releasing stem will only start moving when pressure approaches the pressure setpoint. In all other cases, it remains fixed. Furthermore the assembly has a very high resistance to shocks. If pressure approaches the setpoint, the releasing stem turns, but with the slightest shock or vibration it will go back to its initial position and pressure returns to normal. The mechanism is said to be non memorizing.

* The 8/10 tube should be angle-shaped on the top to avoid water from entering.

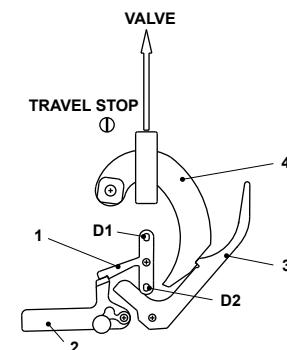


Figure 14. Mechanism Details

Resistance to shocks

This assembly has a remarkable resistance to shocks (20 vertical shocks of 4 J and 20 pendular shocks of 9.81 J), with pressure close to setpoint (for example: 186 mbar for a setpoint of 200 mbar).

CONNECTIONS (BM)

- Fixation BM / Connector:
H M7 or H M8 screws
16 N·m torque
- Sealed BM / Connector:
Flat O-ring (water resistant)
Packing gland (gas resistant)
- Mechanism contact / Slam shut valve:
Control rod
- BM connector / atmosphere:
Integrated vent nipple with screen (supplied) or
compression fitting (supplied) for 8/10 tube
(not supplied)*
- Electrical connection:
See page 6

MECHANISM BOX (BM) MATERIAL

Table 6. Mechanism Box (BM) Material

| | | | |
|-----------|--------------------|-----------------|---------------|
| Box | Body | Aluminum | Chromatation |
| | Cover | Aluminium | Chromatation |
| | Position indicator | Polycarbonate | ---- |
| | Self-jamming ring | Steel | Phosphatation |
| | Cover nut | Stainless steel | ---- |
| | Circlips | Steel | Phosphatation |
| Mechanism | All parts | Stainless HR | ---- |
| | Brackets | Brass | ---- |
| | Bolt | Brass | ---- |
| | Elastic O-ring | Steel | Phosphatation |
| | Torsion spring | Stainless steel | ---- |
| Yoke | Traction spring | Bronze | ---- |
| | Self-jamming ring | Steel | Phosphatation |
| O-rings | Flat | EPDM | ---- |
| | Cover | Neoprene (CR) | ---- |
| | Truarc ring | Nitrile (NBR) | ---- |

COMMISSIONING (BM)

Commissioning differs depending on whether the assembly has an internal or external bypass and whether overpressure releasing is required or not. See corresponding technical manuals for further details.

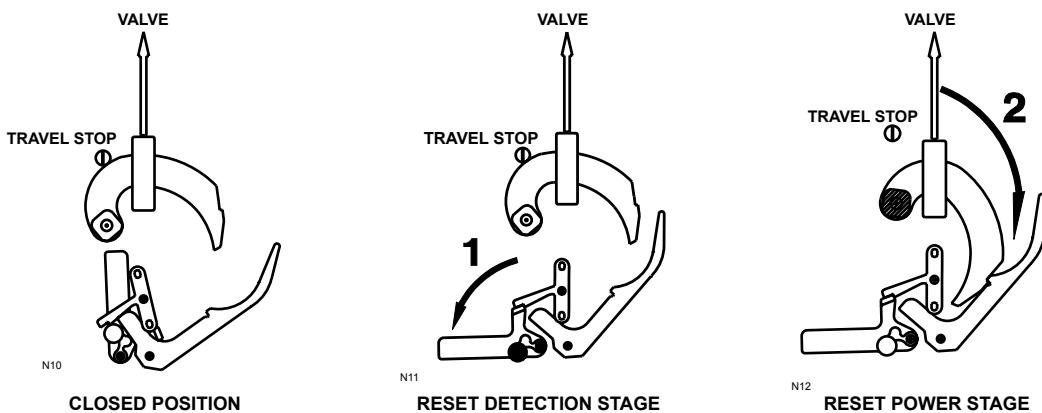


Figure 15. Release Activation Stages

Note

The position of the travel stop (Figure 10, key 7) depends on the type of assembly and its size. Position A, B or C depending on max. travel of slam shut valve: A = 15 mm travel, B = 35 mm travel, C = 50 mm travel.

- **Mechanism box (BM) intervention**

To access the box the cover must be removed. When unscrewing the nut a circlips is used to remove the O-ring. The cover is held on by one screw which can be unscrewed manually or using a socket screw key (recommended torque for optimal shutoff: 6 N·m).

- **Resetting**

To reset the slam shut (after the fault has been settled), the 1st mechanism stage must be reset by manually turning the 1st stage trigger. If the slam shut has an internal bypass the cam must be slightly turned using a resetting key to bypass. If the slam shut has an external bypass, a bypass valve will be used. In both cases:

- Wait for the pressure to be equalized before resetting the 2nd mechanism stage.
- When resetting the 2nd mechanism stage (opening of the valve) a reset key is used (delete).

Table 7. Packing Gland Material

| | | |
|-------------|-----------------|------------------|
| Body | Bronze | ---- |
| Control rod | Stainless steel | Chromium plating |
| Truarc ring | Nitrile (NBR) | ---- |

**CAUTION**

Never use an extension pipe with the reset key when resetting the 2nd stage (max. normal torque 16 N·m, never go over 32 N·m).

**WARNING**

AUTHORIZED PERSONNEL ONLY
Risk of injury

After rearming, remove the reset key from the stem. Do not put fingers in or near the reset mechanism area.

MAINTENANCE (BM)

- **Tools:**

- Spanner 11 (screw 7) and 13 (or 14) (screw 8)
- Screwdriver

- **Control**

- 1st and 2nd stage mechanism releasing
- Packing gland is tight shut
- Yoke greasing

- **Disassembly**

- Check that assembly is not under pressure
- Manual release of slam shut (Figure 14)
- Manually press on the releasing stem pin D1 or D2 (Figure 14, key 1) parallel to the BMS axe
- Unscrew the travel stop (screwdriver)
- Unscrew the BM fastening screws (flat spanner 11 (screw 7) and 13 (or 14) (screw 8))
- Disassemble the mechanism box (BM) from the connector by unlocking the yoke

- **Assembly**

- Proceed in reverse order to disassembly

OPTIONS (BM)

- **Remote alert (on BM1 or BM2)**

Detects 2nd stage releasing (power)

- **Remote control**

Atmospheric solenoid valve (releasing by min. pressure) for max. releasing pressure of 30 bar. Safety manometric box (BMS) activated with a pneumatic or electro-pneumatic impulse.

- **Manual control on BM2 with 1 Type BMS 1 only**

Push button (connected at the same place as a Type BMS 2).

Type OS2

Contact

Table 8. Mechanism Box (BM) Connections

| | AC | DC |
|----------------|--|-------|
| Max. intensity | 7.0 A | 0.8 A |
| Max. tension | 400 V | 250 V |
| Protection | EEx-d IIC T6 | |
| Tightness | IP 66 | |
| Temperature | -29°C +71°C | |
| Fastening | 2 M3 screws | |
| Cable | 3 wires (black, brown, blue) H05VVF (3 x 0.75 mm ²) D 6.5 mm | |

Table 9. Mechanism Box (BM) Versions

| Version | Installation | Sealing | Connection | Mechanical Connection | Electrical connections | | | |
|---------|--------------------|---------|-----------------|--|------------------------|------|-------|----------------|
| | | | | | Common | NF | NO | Connection |
| C0 | ---- | IP 68 | Without | 1/2 NPT cap | | | | ---- |
| C1 | Explosion proof | IP 68 | Explosion proof | 3 m wire | Black | Blue | Brown | Wires |
| C2 | Explosion proof | IP 68 | | Explosion proof connector box/PE explosion proof | 3 | 4 | 5 | Screwed wiring |
| C3 | Intrinsically safe | IP 68 | | Intrinsically safe tight-shut connector | A | B | C | Welded wiring |

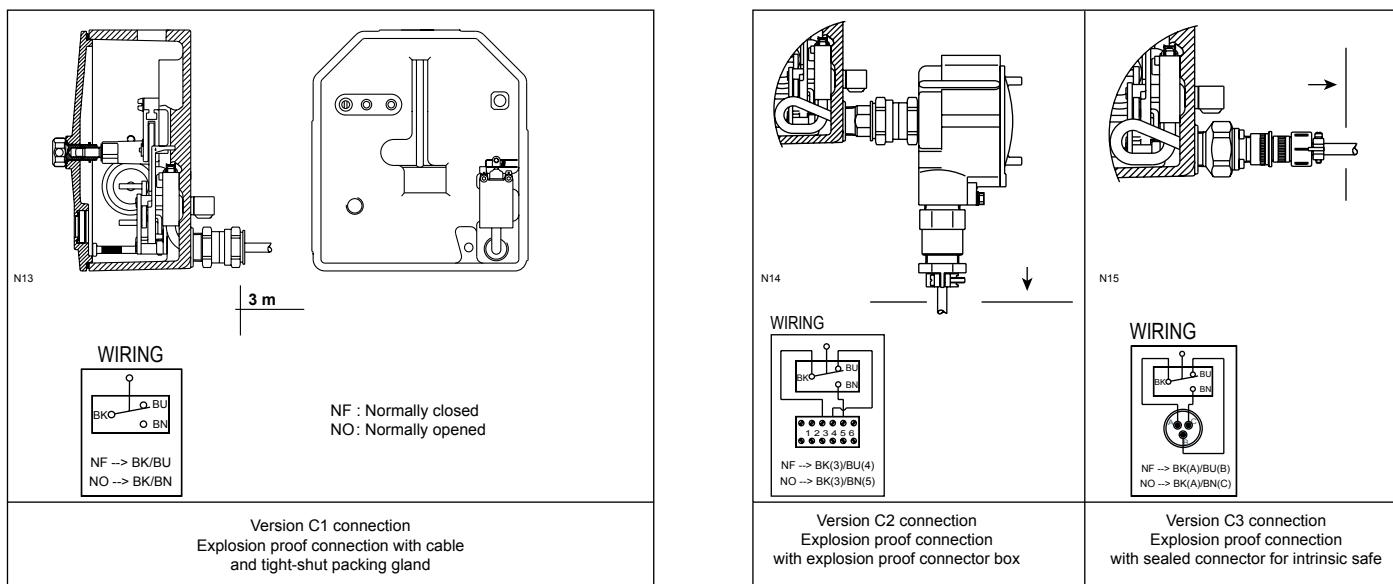
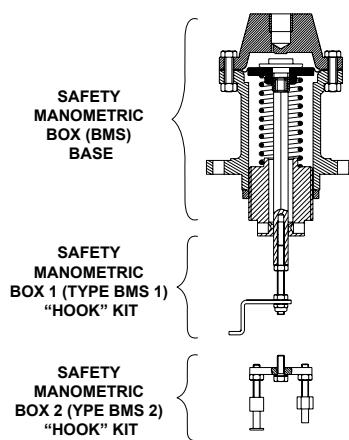


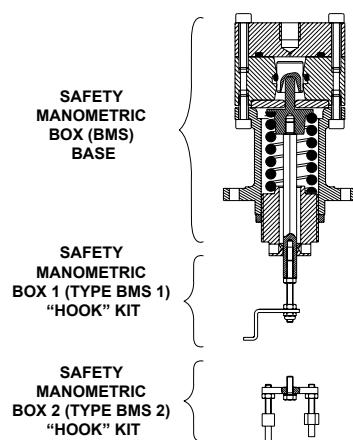
Figure 16. Different Versions of BM Connections

SAFETY MANOMETRIC BOX (BMS) DESCRIPTION AND SPARE PARTS



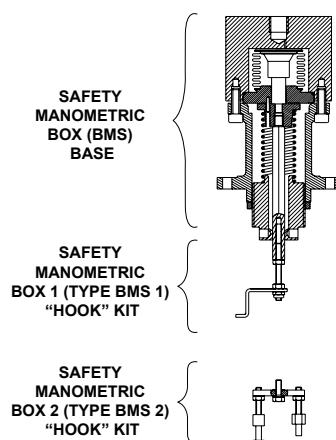
N16

Figure 17. BMS with Diaphragm



N17

Figure 18. BMS with Piston



N18

Figure 19. BMS with Bellows

Table 10. Spare Parts

| Description | Diaphragm (Max. and/or Min.) | | Piston (Max. or Min.) | | Bellows (Max. and/or Min.) | |
|-------------|------------------------------|---------|-----------------------|---------|----------------------------|---------|
| | 162 | 71 | 27 | 17 | 236 | 315 |
| Type BMS 1 | Compete box | 181 071 | 181 072 | 180 999 | 180 998 | 181 073 |
| | Base | 181 105 | 181 106 | 181 107 | 181 108 | 181 109 |
| | Hook kit | | | 181 111 | | |
| Type BMS 2 | Compete box | 181 084 | 181 085 | 181 070 | 181 069 | 181 086 |
| | Base | 181 105 | 181 106 | 181 107 | 181 108 | 181 109 |
| | Hook kit | | | 181 112 | | |
| Spare Parts | Diaphragm | 137 906 | 142 549 | --- | --- | --- |
| | Set of O-rings | | --- | | 197 352 | --- |

Items in bold are spare parts.

DESCRIPTION (BMS)

- **Impulse line**

The impulse line (IS) is connected to the network to be protected (normally downstream of the regulator).

- **Impulse type**

Depending on the pressure and precision required, different types of impulse may be used: Diaphragm, Piston or Bellows.

- **Springs**

To cover all pressure ranges, a set of springs of equal length and diameter, but of different wire diameter (2 to 6.5 mm), may be used.

- **Detection**

Table 11. Detection Configurations

| | Actioner | Max. only | Min. only | Max. and Min. |
|------------|-------------|-----------------|-----------|---------------|
| One BMS | Type BMS 1 | Releasing screw | Active | Neutral |
| | | Hook | Neutral | Active |
| Two BMS | Type BMS 1 | Releasing screw | Active | --- |
| | | Hook | Neutral | --- |
| Type BMS 2 | Push button | Active | Neutral | Active |
| | Hook | Neutral | Active | Active |

OPERATION (BMS)

The pressure of the network to be protected pushes the diaphragm, piston or bellows. The force resulting from this opposes the force (adjustable) coming from the setpoint spring. When pressure varies, the detection rod moves and provokes releasing by max. or min. pressure.

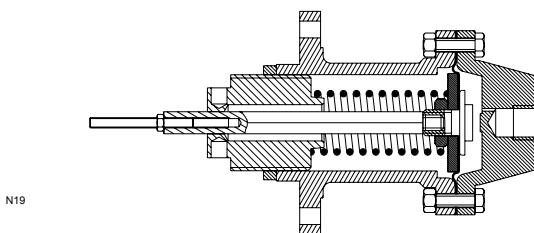
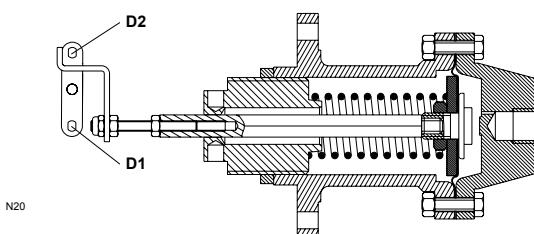
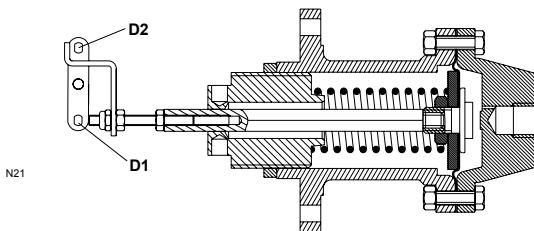
CONNECTIONS (BMS)

On the mechanism box: 2 H M6x16 screws (code 402018)

BM sealing: Flat O-ring and tight shut O-rings
On the manometric box: 1/4" NPT screw

Recommended tube: 8/10 mm

The sensing line must be connected downstream of the regulator.

**Figure 20. Type BMS 1 Max. Only****Figure 21. Type BMS 1 Min. Only****Figure 22. Type BMS 1 Max. - Min.****Table 12. Max. Pressure Releasing**

| Pressure | Type BMS 1 | Type BMS 2 |
|------------|--|------------------------|
| | Releasing screw | Push button |
| Normal | Without D1 pin contact | Without D2 pin contact |
| Increase | With D1 pin contact | With D2 pin contact |
| = Setpoint | Rotation of releasing stem and 1st stage trigger | |

Table 13. Min Pressure Releasing

| Pressure | Type BMS 1 | Type BMS 2 |
|------------|--|------------------------|
| | Hook | Hook |
| Normal | Without D2 pin contact | Without D1 pin contact |
| Decrease | With D2 pin contact | With D1 pin contact |
| = Setpoint | Rotation of releasing stem and 1st stage trigger | |

Type OS2

SPRING ADJUSTMENTS RANGES (BMS)

(See definitions on page 9)

Table 14. Max. Only Spring Adjustment Ranges

| MAX. ONLY | BMS | | | SPRING | | MAX. ONLY | | | INTERVALS $\Delta 1$ | |
|-----------|-----------|------|------------------|---------------------|---------|-------------------------------|-------------------|-------|-------------------------|--|
| | Type | Size | PMS box (bar) | ϕ Wire (mm) | Code | Wdso setting, bar | | | | |
| | | | | | | Max. low point possible | Recommended range | | | |
| MAX. ONLY | Diaphragm | 162 | 10 | 2.0 | 113 195 | 0.010 | 0.015 | 0.035 | 0.004 | |
| | | | | 2.5 | 113 196 | 0.025 | 0.040 | 0.080 | 0.005 | |
| | | | | 3.0 | 113 197 | 0.045 | 0.080 | 0.140 | 0.010 | |
| | | | | 3.5 | 113 198 | 0.070 | 0.070 | 0.240 | 0.014 | |
| | | 071 | | 4.0 | 113 199 | 0.115 | 0.140 | 0.380 | 0.018 | |
| | | | | 5.0 | 113 201 | 0.140 | 0.300 | 0.750 | 0.050 | |
| | | | | 5.5 | 113 202 | 0.250 | 0.600 | 1.3 | 0.080 | |
| | | | | 6.5 | 114 139 | 0.450 | 1.2 | 2.3 | 0.170 | |
| | Piston | 027 | 100 | 4.5 | 113 200 | 1.0 | 2.0 | 5.1 | 0.350 | |
| | | | | 5.5 | 113 202 | 2.1 | 4.0 | 11.0 | 0.700 | |
| | | 017 | | 6.5 | 114 139 | 4.0 | 8.0 | 16.0 | 1.6 | |
| | | | | 5.5 | 113 202 | 16.0 | 16.0 | 22.0 | 3.0 | |
| | Bellows | 236 | 35 | 6.5 | 114 139 | 22.0 | 22.0 | 40.0 | 6.5 | |
| | | | | 5.5 | 113 202 | 40.0 | 40.0 | 55.0 | 7.0 | |
| | | 315 | | 6.5 | 114 139 | 55.0 | 55.0 | 100.0 | 12.0 | |
| | | | | 5.5 | 113 202 | 5.5 | 11.0 | 22.0 | 1.6 | |
| | | 315 | 72 | 6.5 | 114 139 | 8.3 | 16.0 | 35.0 | 2.5 | |
| | | 315 | 72 | 5.0 | 113 201 | 17.5 | 35.0 | 72.0 | 5.0 | |

Table 15. Min. Only Spring Adjustment Ranges

| MIN. ONLY | BMS | | | SPRING | | MIN. ONLY | | | INTERVALS $\Delta 1$ | |
|-----------|-----------|------|------------------|---------------------|---------|-------------------------------|-------------------|-------|-------------------------|--|
| | Type | Size | PMS box (bar) | ϕ Wire (mm) | Code | Wdsu setting, bar | | | | |
| | | | | | | Min. low point possible | Recommended range | | | |
| MIN. ONLY | Diaphragm | 162 | 10 | 2.0 | 113 195 | 0.010 | 0.015 | 0.035 | 0.004 | |
| | | | | 2.5 | 113 196 | 0.025 | 0.040 | 0.080 | 0.005 | |
| | | | | 3.0 | 113 197 | 0.045 | 0.080 | 0.150 | 0.010 | |
| | | | | 3.5 | 113 198 | 0.070 | 0.070 | 0.240 | 0.014 | |
| | | 071 | | 4.0 | 113 199 | 0.115 | 0.150 | 0.400 | 0.018 | |
| | | | | 5.0 | 113 201 | 0.140 | 0.300 | 0.650 | 0.050 | |
| | | | | 5.5 | 113 202 | 0.250 | 0.600 | 1.15 | 0.080 | |
| | | | | 6.5 | 114 139 | 0.450 | 1.1 | 2.0 | 0.170 | |
| | Piston | 027 | 100 | 4.5 | 113 200 | 1.0 | 2.0 | 4.7 | 0.350 | |
| | | | | 5.5 | 113 202 | 2.1 | 4.0 | 9.5 | 0.700 | |
| | | 017 | | 6.5 | 114 139 | 4.0 | 8.0 | 14.4 | 1.6 | |
| | | | | 5.5 | 113 202 | 16.0 | 16.0 | 19.0 | 3.0 | |
| | Bellows | 236 | 35 | 6.5 | 114 139 | 19.0 | 19.0 | 38.0 | 6.5 | |
| | | | | 5.5 | 113 202 | 38.0 | 38.0 | 50.0 | 7.0 | |
| | | 315 | | 6.5 | 114 139 | 50.0 | 50.0 | 90.0 | 12.0 | |
| | | | | 5.5 | 113 202 | 5.5 | 11.0 | 16.0 | 1.6 | |
| | | 315 | 72 | 6.5 | 114 139 | 8.3 | 16.0 | 28.0 | 2.5 | |
| | | 315 | 72 | 5.0 | 113 201 | 17.5 | 28.0 | 65.0 | 5.0 | |

Table 16. Max. and Min. Spring Adjustment Ranges

| MAX. AND MIN. | BMS | | | SPRING | | MAX. and MIN. | | INTERVALS $\Delta 1$ and $\Delta 2$ | | | | | | |
|---------------|--------|------|--|--|--|--|--|--|---------------------|--|--|--|--|--|
| | Type | Size | PMS box (bar) | \varnothing Wire (mm) | Code | Wdsu setting (bar) | | $\Delta 1$ (bar) | $\Delta 2$ (bar) | | | | | |
| | | | | | | Min. low point possible | Max. high point | | | | | | | |
| Diaphragm | 162 | 10 | 2.0 2.5 3.0 3.5 4.0 5.0 5.5 6.5 | 113 195 113 196 113 197 113 198 113 199 113 201 113 202 114 139 | 0.010 0.025 0.045 0.070 0.115 0.140 0.230 0.450 | 0.035 0.080 0.140 0.240 0.380 0.750 1.3 2.3 | 0.004 0.005 0.010 0.014 0.018 0.050 0.080 0.170 | 0.010 0.025 0.050 0.060 0.150 0.350 0.600 1.1 | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | Piston | 027 | Not possible with only 1 BMS | | | | | | | | | | | |
| | | 017 | | | | | | | | | | | | |
| Bellows | 236 | 35 | 5.5 | 113 202 | 5.5 | 16.0 | 1.6 | 10.0 | | | | | | |
| | | | 6.5 | 114 139 | 8.3 | 28.0 | 2.5 | 20.0 | | | | | | |
| | 315 | 72 | 5.0 | 113 201 | 17.5 | 65.0 | 5.0 | 33.0 | | | | | | |

DEFINITIONS

Table 17. Definitions

| | |
|-------------------------|---|
| PSD box | Maximum operating pressure for box |
| Pd | Nominal downstream regulator pressure |
| Pd max | Maximum downstream regulator pressure (normally closing regulator pressure) |
| Pd min | Minimum downstream regulator pressure (disturbance in function with flow and/or inlet pressure is to be considered) |
| Pdo | Maximum releasing pressure |
| Max. high point | High regulator pressure at maximum |
| Max. low point | Low regulator pressure at maximum remaining within the accuracy class |
| Max. low point possible | Low regulator pressure at furthest maximum point (precision is not guaranteed) |
| Pdu | Minimum releasing pressure |
| Min. high point | High minimum regulator pressure |
| Min. low point | Low regulator pressure at minimum remaining within the accuracy class |
| Min. low point possible | Low regulator pressure at furthest minimum point (precision is not guaranteed) |
| Wdso | Overpressure specific range obtained from slam shut valve |
| Wdsu | Underpressure specific range obtained from slam shut valve |
| $\Delta 1$ | Minimum difference allowed between Pdo and Pd max. and/or between Pdu and Pd min. |
| $\Delta 2$ | Maximum difference allowed between maximum and minimum releasing pressure |

SELECTION GUIDE LINES: PRESSURE LIMITATIONS

Table 18. Pressure Limitations

| Max. Only | Min. Only | Max. and Min. |
|--|--|--|
| Pdo ≤ PMS box (BMS) Pdo ≤ Max. high point Pdo ≥ Max. low point Pdo ≥ Pd max. + $\Delta 1$ | Pd max. < PMS box (BMS) Pdu ≤ Max. high point Pdu ≥ Min. low point Pdu ≥ Pd min. - $\Delta 1$ | Pdo ≤ PMS box (BMS) Pdo ≤ Max. high point Pdo ≥ Pd max. + $\Delta 1$ Pdu ≥ Min. lowest point possible Pdu ≤ Pd min. - $\Delta 1$ Pdu - Pdu ≤ $\Delta 2$ |

Type OS2

Note

When the setpoint (max. or min.) falls between the lowest and lowest point possible, the precision may pass into a superior range (example AG 2.5 → AG 5). If the point value is too close to that of the Pd, the option RJGI tripping is recommended (consult factory). In the case of two safety manometric boxes (BMS) both boxes should have a PSD > to the highest Pdo.

SELECTION OF BMS AND SPRINGS

Choose the type of safety manometric box (BMS) according to: PMS, the type of releasing precision.

Choice of springs:

- **Max. or Min. only**

Take the spring with the highest point directly superior to the releasing pressure required.

- **Max. and Min.**

Take the spring with the highest maximum point superior to the maximum releasing pressure required or with the lowest point inferior to the minimum tripping pressure required.

Table 19. Choice of BMS and Springs

| PSD | Diaphragm | Bellows | Piston |
|---------------|-----------|---------|--------|
| 0 to 20 | | | |
| 20 to 72 | | (*) | |
| 72 to 100 | | | |
| AG 2.5 | | | |
| AG 5 | | | |
| Max. only | | | |
| Min. only | | | |
| Max. and Min. | | | |

(*) Choice between piston (regular) and bellows (optional). Bellows are recommended if you require a small gap between releasing pressure, inlet pressure and exact precision. Pistons do not facilitate minimum and maximum releasing.

MATERIALS (BMS)

Table 20. BMS Material

| | Diaphragm | Bellows | Piston |
|------------------|-------------------|-------------------------|-----------------|
| Spring case | Zinc-plated steel | | Stainless steel |
| Spring box | | Aluminum + Chromatation | |
| Diaphragm | Nitrile mesh | | |
| Piston | | | Stainless steel |
| Bellows | | Stainless steel | |
| Spring | | Zinc-plated steel | |
| Adjustment screw | | Zinc-plated steel | |



WARNING

AUTHORIZED PERSONNEL ONLY

Risk of injury

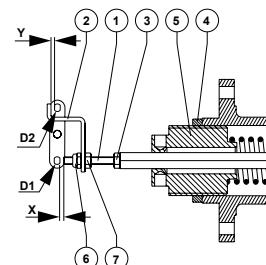
After rearming, remove the reset key from the stem. Do not put fingers in or near the reset mechanism area.

ADJUSTMENT (BMS)

Generally speaking, adjustments are carried out with the slam shut valve closed. Only the detection stage is reset. Control of the releasing value may be obtained by resetting the two stages.

CAUTION

Before any adjustment, check that the spring range installed corresponds to the required setpoint.



Type BMS 1 (Figures 17 to 19) Releasing by Max. Only

- Adjusting the releasing screw Free the min. hook (key 2). Then in the following conditions:
 - no pressure in the safety manometric box (BMS),
 - setpoint spring compressed so that the distance between the releasing screw and the pin D1 no longer increases, adjust the releasing screw (key 1) to $X = 1.5$ mm (detection stage set). Jam nut (key 3).
- Adjusting the max. only releasing pressure Admit the releasing pressure to Pdo. Screw the adjustment screw (key 5) until detection stage can be set. Unscrew the adjustment screw (key 5) until detection stage release. Check the pressure value at the releasing point (adjust if necessary). Jam nut (key 4).

Releasing by Min. Only

- Adjusting the releasing screw and hook Free the min. hook (key 2). Then in the following conditions:
 - setpoint spring decompressed (adjustment screw (key 5) unscrewed),
 - pressure equal to the releasing pressure required for Pd min in the BMS,adjust the releasing screw (key 1) to $X = 2$ mm (detection stage set). Jam nut (key 3). Put the hook (key 2) into position and adjust $Y = 1.5$ mm with nuts (key 6) and (key 7). Jam nuts (key 6) and (key 7).
- Adjusting the min. only releasing pressure Continue admitting the required releasing pressure. Screw the adjustment screw (key 5) until detection stage release. Check the pressure value at the releasing point (adjust if necessary). Jam lock nut (key 4).

Releasing by Max. and Min. (Diaphragms or Bellows Only)

- **Adjusting the releasing screw**

Free the min. hook (key 2).

Then in the following conditions:

- setpoint spring decompressed (adjustment screw (key 5) unscrewed),
- pressure equal to the max. releasing pressure required in the BMS,

adjust the releasing screw (key 1) to $X = 0$ mm (detection stage set).

Release manually.

Unscrew the releasing screw (key 1) 2 turns, which represents a distance of approximately 1.5 mm.

Jam nut (key 3).

- **Max. adjustment**

Same procedure as paragraph "Adjusting max. only releasing pressure"

- **Min. adjustment**

Admit an average pressure between max. and min., (for example: regulator set-point pressure).

Set the slam shut.

Admit a pressure equal to the min. Pd min. releasing pressure required.

Adjust the hook (key 2) by progressively moving nuts (key 6) and (key 7) until it releases.

Jam nuts (key 6) and (key 7).

Check the pressure value at the releasing point (adjust if necessary).

Type BMS 2 with 1 Max. Only Type BMS 1 Releasing by Max. Only

- **Adjusting the max. push button**

Remove the hook (key 2).

Then in the following conditions:

- no pressure in the BMS,
- setpoint spring compressed so that the distance between the push button (key 1) and the pin D2 no longer increases,

Adjust the push button (key 1) to $X = 1.5$ mm (detection stage set).

Jam nut (key 3).

- **Adjusting the max. only releasing pressure**

Same procedure as paragraph "Adjusting the max. only releasing pressure".

Releasing by Min. Only

- **Adjusting the min. only releasing pressure**

Remove the max. push button (key 1) or screw it tight to neutralize it.

Jam nut (key 3).

Then in the following conditions:

- setpoint spring decompressed (adjustment screw (key 5) unscrewed),
- pressure equal to releasing pressure required in the BMS, adjust the min. hook (key 2) to $Y = 1.5$ mm (detection stage set).

Jam nut (key 6).

- **Adjusting the min. only releasing pressure**

Same procedure as paragraph "Adjusting max. only releasing pressure".

Releasing by Max. and Min.

- **Adjusting the push button**

The min. hook (key 2) is completely unscrewed.

Then in the following conditions:

- setpoint spring decompressed (adjustment screw (key 5) unscrewed),
- pressure equal to the max. releasing pressure required in the BMS.

adjust the push button (key 1) to $X = 0$ mm (detection stage set).

Release manually.

Unscrew the push button (key 1) 2 turns, which represents a distance of approximately 1.5 mm.

Jam nut (key 3).

- **Adjusting the releasing pressure to max. and min.**

Max. adjustment

Same procedure as paragraph "Adjusting the max. only releasing pressure".

Min. adjustment

Admit an average pressure between max. and min., (for example regulator set-point pressure).

Set the detection stage.

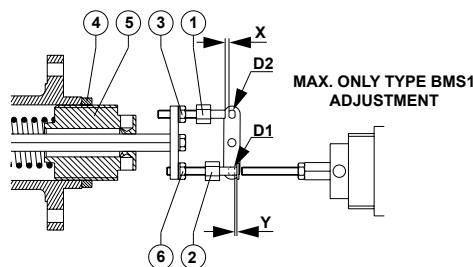
Admit a pressure equal to the min. releasing pressure required.

Screw the hook (key 2) progressively until detection stage release.

Jam nut (key 6).

Check the pressure value at the releasing point (adjust if necessary).

N23



Type OS2

MAINTENANCE (BMS)

• Control

The safety valve and pressure accessories are subject to normal wear and must be inspected periodically and replaced if necessary.

- Slam shut releasing
- External tight shut
- Impulse part (diaphragm, bellows or piston)

The frequency of inspections, checks and replacement depends on the severity of service conditions and must comply with the national or industrial codes, standards and regulations/recommendations applicable.

• Disassembly

- Unscrew the connector form the sensing line
- Remove the safety manometric box (BMS)
- Unscrew the blocking nut on the adjustment screw (manually)
- Unscrew the adjustment screw (resetting tool)
- Remove the hook or plate, depending on the type of Type BMS 1 or 2, from the detection rod (flat spanner 7)

- Remove the upper case

- | | |
|---|-------------------|
| BMS 162 | (flat spanner 11) |
| BMS 071 | (flat spanner 8) |
| BMS piston 27/17 | (key 5) |
| BMS bellows 236/315 | (key 5) |
| - Disassemble the set plate/counter plate (flat spanner 17 and pliers) or | |
| - Remove the bellows or piston and guide (manually) | |

• Assembly

- Proceed in reverse order to disassembly

• BMS torque values

- | | |
|--|--------|
| - Upper spring case/manometric box | |
| BMS 162: | 8 N·m |
| BMS 071: | 5 N·m |
| BMS piston 27/17: | 6 N·m |
| BMS bellows 236/315: | 6 N·m |
| - BMS 162 and 071 nut/diaphragm plate: | 20 N·m |

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